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THE MASSACHUSETTS ASSOCIATION OF BOARDS OF HEALTH was organized in Boston, March, 1890, with the following objects: The advancement of sanitary science; the promotion of better organization and co-operation among local boards of health, and the uniform enforcement of sanitary laws and regulations.

THE JOURNAL OF THIS ASSOCIATION has for fifteen years faithfully reflected the views of the public hygienists of Massachusetts. With the November issue of the year 1904, the encouragement received from many hygienic quarters induced the Association to undertake the expansion of the Journal to a national standard, with the co-operation of many noted sanitarians as editors. A new title was selected, while the older and well-established title was retained also.

The dates of publication are FEBRUARY, MAY, AUGUST and NOVEMBER of each year.

THE JOURNAL will contain the papers read at the meetings of the Association, papers contributed by hygienists, report of the discussions, editorials, abstracts, reviews and hygienic notes of professional interest. Subscription rates, $1.00 per year. Reprints furnished at cost price.

All Communications concerning the JOURNAL, copy, proof, subscriptions, advertisements, etc., should be addressed to the Managing Editor, DR. H. W. HILL, 739 BOYLSTON ST., BOSTON, MASS.

All communications concerning the ASSOCIATION should be addressed to the Secretary of the Association, JAMES C. COFFEY, CITY HALL, WORCESTER, MASS.

All bills not relating to the Journal, and MEMBERSHIP DUES ($2.00 per year), should be sent to the Treasurer of the Association, DR. JAMES B. FIELD, 329 WESTFORD ST., LOWELL, MASS.

EDITORIALS.

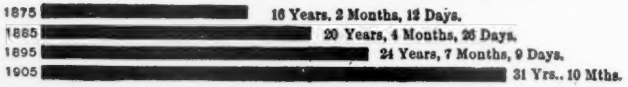
CHICAGO VITAL STATISTICS AGAIN.

Our criticisms of the Chicago Vital Statistics found their way into the daily press on April 14th when the Chicago Record-Herald reprinted a large part of what was said in the American Journal of Hygiene on this subject. The Chicago Tribune took the matter up editorially and in the news columns on April 16th. A single exposure in the public press will do more to check the extravagance of the Chicago Health Department than any amount of criticism in professional journals. Repeated attacks during several years had failed to draw a spark from Chicago, but the publicity afforded by the Tribune and Record-Herald gave the Health Department a real sensation.

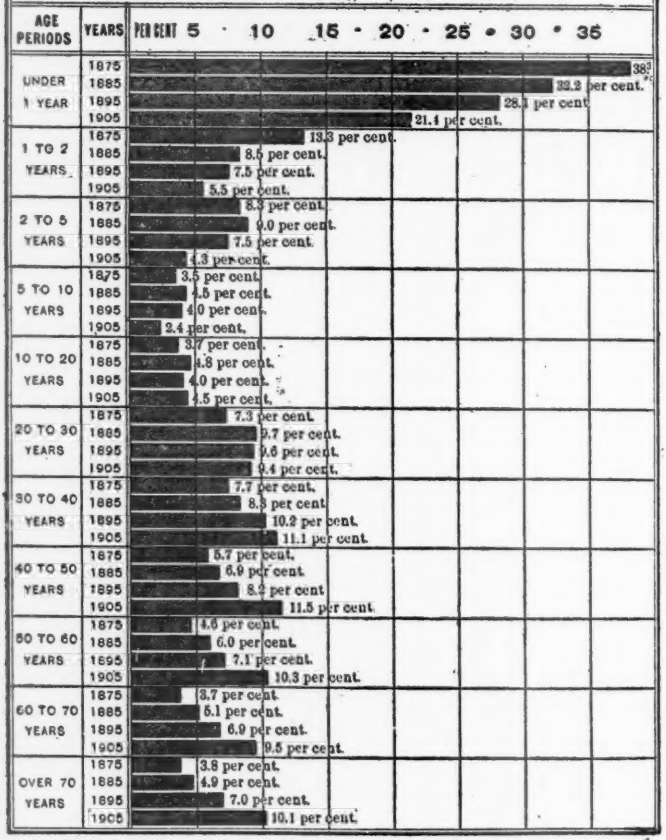
The work of the special committee of the Chicago Medical Society was a singularly appropriate forerunner of the Biennial Report for 1904 and 1905 which was in press when the committee was appointed. The frontispiece to that report is a fine example of that form of statistical absurdity which most delights Chicago, and oftenest provokes the self-appointed critics. It is the oft-told tale of increasing duration of life in Chicago, and is reproduced here because it carries its own reputation, as is not usually the case. The four columns at the top represent the average age of decedents in 1875, 1885, 1895 and 1905, and we are told at the foot of the page that the exhibit signifies a doubling of the average duration of human life in Chicago in a single generation. But in this exhibit the misguided statistician has included an analysis of the mortality by ages, and this circumstance furnishes the long desired proof that the statistical vagaries of Chicago are chargeable not to moral obliquity. but to mental infirmity.

INCREASING DURATION OF LIFE IN CHICAGO

AVERAGE AGE OF DECEDENTS IN CHICAGO IN THE YEARS—



PROPORTION OF DEATHS AT GIVEN AGES TO TOTAL DEATHS AT ALL AGES.



Measured by the average age at death of all who died in the city of Chicago thirty years ago and of those who died in 1905, the average duration of life in this city has nearly doubled during a single generation.

A reasonable interpretation of the figures is to be sought in the age distribution of the dead. I have rearranged these figures for 1875 and 1905 in the following table and the Baltimore figures are also shown for comparison.

Age distribution of the dead in Chicago in 1875 and 1905, compared with the age distribution of the dead in Baltimore in 1905:

	Chicago		Baltimore
Ages	1875	1905	1905
Under 1 year	383	214	—
1—2	133	55	—
2—5	83	43	—
Total under 5	599	312	292
5—10	35	24	24
10—20	37	45	45
20—30	73	94	91
30—40	77	111	91
40—50	57	115	101
50—60	46	103	103
60 and over	76	196	253
	1000	1000	1000

Note that in 1875 more than half of Chicago's dead are under the age of two years, and about one in fourteen was over 60. In 1905, on the other hand one-half of Chicago's decedents were over 30 years of age, and about one in every five was over 60. To the normal mind this indicates that children were relatively more numerous, and old persons relatively fewer in Chicago in 1875 than in 1905. Comparing the 1905 mortality of Chicago with that of Baltimore for the same year, one finds that while Baltimore counted 292 children under 5 years in every 1000 dead, Chicago counted 312 children under 5 years in every 1000 of her dead. If

Chicago arithmetic were good in Baltimore, we should say that the Chicago mortality for that age period is 6.85 per cent greater than that of Baltimore. But that would be atrocious nonsense. Above the age of 60, Chicago counted 196 in every 1000 of her decedents, while Baltimore counted 253 above that age in every 1000 of her dead. The arithmetic of Chicago would interpret this to mean that men over 60 have 29 per cent better chances of continued existence in Chicago than in Baltimore. That would be atrocious nonsense. The figures mean simply that Chicago has relatively more children under five and relatively fewer persons over 60, living and exposed to the uncertainties of life. The figures mean nothing to the advantage or disadvantage of either city. If the figures mean neither advantage nor disadvantage, then we should be able to learn, from the mortality figures for *both* cities with the population figures for *one* city, how many people were living in these ages in the *other* city. The U. S. Census Reports for 1900 show that Chicago had 112 persons below 5, and 42 persons above 60, in each 1000 of her living population, or 154 (42 plus 112) persons living in both periods. Chicago lost, in 1905, (312 plus 196) 508 persons in both age periods, while Baltimore lost 545 (292 plus 253) in both age periods. The problem is to find how many persons, other things being equal, Baltimore ought to have had alive in both age periods. The formula is $\frac{X}{545}=\frac{154}{508}$ and the result is X=165.

Baltimore, other things being equal, should have had 165 persons above 60 and below five for each 154 persons in Chicago in these two age periods.

Below are the census figures showing age distribution of the living in both Chicago and Baltimore in 1900, and it will be noted that Baltimore had in fact 164 persons in their age periods while our computed number was 165. Interpreted Chicago-wise this would mean that Baltimore has six-tenths of one per cent over Chicago in the matter of mortality at the extremes of life. But this would be atrocious nonsense in the twentieth decimal dilution.

AGE DISTRIBUTION OF LIVING IN CHICAGO AND IN BALTIMORE IN 1900:

	Chicago	Baltimore
Under 5 years	112	99
5—10	110	101
10—20	183	195
20—30	202	201
30—40	176	148
40—50	113	108
50—60	62	83
60 and over	42	65
	1000	1000

Baltimore is older than Chicago and the flamboyant page means only that Chicago in 1905 is about twelve times as old as she was in 1875. In other words the verdancy of her arithmetic signifies the succulent verdure of youth.

Let us see how old Chicago is as compared with Baltimore. If one divides a population into two equal parts so that half the people are above and half below a certain age, the age at which the population thus evenly divides is called the median age. Taking the figures here discussed one finds that the median age of the dead in Chicago in 1875 was under two years. If we divide the roll of the dead into equal parts, half of the dead are found to be under, and half of them over the age of 1.9 years. Thirty years later, the roll of the dead in Chicago, in 1905, splits at 32.25 years. The median age of the dead in Baltimore in 1875 cannot be thus ascertained, but in 1905 the median age of the dead was 35.3 years. The median age of the living in Chicago in 1900 according to the Census figures was 24.7 years, while the median age of the living in Baltimore in 1900 was 25.2 years.

MEDIAN AGES OF THE DEAD IN CHICAGO AND BALTIMORE.

Chicago		Baltimore
1875	1905	1905
1.9 yrs.	32.25 yrs.	35.3 yrs.

MEDIAN AGES OF THE LIVING IN CHICAGO AND BALTIMORE IN 1900.

Chicago	Baltimore
24.7	25.2

From these figures it will be seen that on any unit of age for a city corresponding to the unit of age for an individual, Chicago in 1875 was a cooing babe attired with safety pins, while Baltimore had a piping treble voice and short breeches.

JOHN S. FULTON.

THE REAL SIGNIFICANCE OF BACTERIAL STANDARDS (COUNTS) FOR MILK.

The sources of impurity in milk may be classified as intra-bovine and extra-bovine. Under intra-bovine sources lie those derived from the cow itself before the withdrawal of the milk, in the form of chemical bodies, the result of abnormal metabolism, or in the form of bacteria or bacterial products, derived from infections of the cow. Under extra-bovine sources lie all the incidental and accidental contacts which the milk after withdrawal from the cow suffers from dust, hands of the milkers, utensils, etc., etc.; and the deliberate non-accidental addition to the milk of foreign substances. (Legally the subtraction from the milk of any normal constituent is also considered as an adulteration.) Leaving out of consideration infectious material added to the milk by milk handlers suffering from, or in close contact with, the ordinary infectious diseases, the ordinary source of the serious extra-bovine impurities in ordinary unadulterated

milk is manure. Only the most extraordinary precautions will prevent the seeding of milk with manure or the bacteria of manure, and a moment's consideration of the nature and life history of the ordinary cow and of the ordinary process of milking will make this entirely obvious.

The souring of milk is universal and (practically) inevitable because the admission to milk of manure or manure-derivatives is universal and (practically) inevitable. The souring of milk indeed has come to be considered a normal process, and the housekeeper complains if the milk does not sour "in the right way" or "at the right time." But this is no more than was believed of pus, which not so many years ago was considered a normal process in the healing of wounds—so much so that physicians distinguished between various forms and stages, spoke of "laudable pus" and were distressed if a wound did not begin "discharging nicely" at the right time. Yet pus was not an essential; it was an incident: but an incident of universal and (practically) inevitable occurrence because under the conditions of those days the admission to wounds of surgical dirt was universal and (practically) inevitable. Eliminate surgical dirt from wounds, and the majority are pusless—eliminate manure from milk and most milk will keep well. But the souring of milk is only a symptom, and a relatively harmless one, of the bacterial action in many directions, set up less obviously and constantly it is true at the same time by the same manure or rather by its bacteria. "The milk, the whole milk and nothing but the milk," is what we now demand. But to eliminate manure from milk requires a technique and training not unlike that which the modern surgeon receives. To make milking an aseptic operation is an ideal that while it may be striven for, is unlikely to succeed outside of specially designed and most carefully supervised dairies. Hence the best that can ordinarily be done is to insist on as little initial infection of milk as is practicable, and to pursue such treatment of the milk after the almost inevitable infection

it almost invariably receives as will prevent the multiplication of the bacteria as far as possible. The catchwords are *cow, cleanliness, cold* and *quickness.* The cow should be healthy, well-fed, and well cared for in all particulars, to insure a high physiological standard and to eliminate the intra bovine impurities. Cleanliness in every detail should be carried out to eliminate initial infection from extra-bovine sources as far as may be; cold should be secured to restrain the development of such infection as cannot be excluded; and quickness in transit and delivery insisted on to insure that the milk is used up before it gets any worse than the stage already reached.

Of course, many persons, admitting all this, will nevertheless say that milk plus manure has been used for thousands of years—their ancestors, immediate and remote, used it—they themselves use it—why fuss about it? The sanitarian has little objection to manure—so long as it contains only organisms which do not disastrously affect the human. Were manure a pure culture of the souring bacteria, there would be little or no sanitary objection to it. But manure is not a pure culture of any one organism—nor a mixed culture of known and unvarying species. Manure is a mixed culture which varies in content, so that it is always under suspicion. It may contain at any time almost any organism, and some of these are themselves dangerous or so affect milk as to make it unfit for food.

The bacterial count of milk is often misunderstood. We eat and drink millions of bacteria every day—our own intestines contain millions of them all the time. Why then should we approve a milk containing 10,000 bacteria and disapprove one containing 20,000? Is not this swallowing a whole caravan of camels, while straining out a single gnat? Besides, it is admitted that the great majority of bacteria in milk are harmless; while the bacterial count is not calculated to discover the harmful ones, if present.

The fact is that the bacterial counts of milk, and this is particularly true of the low counts established for certified milk, do not bear any direct relationship to the poisonous properties of the particular milk from which they come. A milk of 20,000 count is not by any means necessarily twice as bad as one of 10,000 count or 20 times as bad as one of 1,000 count. Indeed if the 20,000 in one case were souring bacteria and the 1,000 in the other were typhoid bacilli, the 1,000 count milk would be infinitely worse than the 20,000 count. The true relation of the count to the milk is that of a cyclometer to a bicycle. By attention to "cow, cleanliness, cold and quickness" in all of the tens of thousands lots of milk now distributed daily all over the continent, the average sanitary quality of all milk would be vastly improved. But how determine, without an amount of inspection quite impracticable, whether these factors have in truth been observed? Milk containing initially even a few bacteria as the best of milk is almost sure to do, carries within itself an automatic register, which faithfully sums up all the insults the milk has received, just as the cyclometer sums up the miles the wheel has traveled. In any given case inattention to any one factor—the admission of an unusual lump of dirt to the milk, an unusual delay at the station, the exhaustion of the ice supply in a particular wagon on a hot day, etc., etc.,—is registered at once by an increase in the bacteria. The bacterial count alone will not tell what the nature of the insult was, any more than the cyclometer will tell where the wheel has been—but the sum total is registered infallibly in both cases. The object in setting a bacterial standard is not merely to secure a few less bacteria per glass, but because the producer must observe all the details necessary concerning "cow, cleanliness, cold and quickness," if he is to meet that standard.

The sources of the impurities in milk are understood perfectly, and nearly perfect techniques for their elimination have been devised, but it still remains to accomplish the most

difficult task of all— to put these into practice, uniformly and constantly, everywhere. To trace the real significance and source of pus in wounds, and to elaborate a technique to eliminate it was a task simple and easy compared with the subsequent training of thousands of surgeons to appreciate and use the necessary arts. Yet surgeons are men of high education and intelligence, and the elimination of pus from wounds is a matter of professional pride and profit to them. To trace the sanitary impurities of milk to their source and to elaborate a technique for their elimination, is a task already accomplished. It remains to train hundreds of thousands of prejudiced, ignorant and unskillful "hired men," inappreciative of the results, to follow, at a financial loss, and under almost impossible conditions the sort of technique which highly trained surgeons find difficult enough in modern hospitals. Is it any wonder that the production of low count milk by the ordinary dairy is a heart-breaking affair? Yet it must be done, somehow, sooner or later, unless asepticism be abandoned, and antisepticism (in the sense of pasteurization) be accepted as the substitute. That a single producer or a group of producers here and there can manage to put on the market a milk sanitarily perfect at a remunerative price does not for a moment solve the problem. Only the well-to-do customer can—or at least will—take advantage of this. It is the business of the sanitarian to secure pure milk for *everyone,* and such a problem might well dishearten any executive. What the ultimate solution may be it is hard to say. The bacteriologist, the veterinarian, the milk-expert have all done their parts and have done them well. The milk problem as it stands now is no longer "what to do" but "how to get it done."

H. W. HILL.

JULY QUARTERLY MEETING
OF THE
Massachusetts Association of Boards of Health.

The quarterly meeting of the Massachusetts Association of Boards of Health was held at Gallup's Island, Boston Harbor, on Thursday, July 26. Dinner was served at 1 P. M.; and after dinner a business meeting was held under the presidency of Dr. H. P. Walcott.

Members of the Association were elected as follows, upon the recommendation of the Executive Committee:

F. E. Stetson, M. D., New Bedford.
Cooper Gaw, New Bedford.
John P. Fahey, Taunton.
John O'Hearn, Taunton.
Chas. B. Fuller, M. D., Waltham.
Richard Collins, M. D., Waltham.
Melvin M. Johnson, Waltham.
Wm. Cook, Leominster.
A. O. Hitchcock, M. D., Fitchburg.
Robert A. Rice, M. D., Fitchburg.
R. E. Stevens, M. D., Marlboro.
Godfrey Knight, Avon.
Michael W. Norris, Boston.
Philip S. Parker, Brookline.
John A. Curtin, Brookline.
Jonas E. Bacon, M. D., Brockton.
Geo. C. Hunt, Worcester.
F. W. Howe, Framingham.

It was voted to dispense with the reading of the records of the last meeting.

THE PRESIDENT: Is there any other business to come before the meeting before proceeding to the pro-

gramme of the afternoon? If not, a paper upon "Some of the Advantages of Certified Milk," by Dr. A. P. Norris of Cambridge is now in order. I have the pleasure of introducing Dr. Norris.

THE WORK OF THE CAMBRIDGE MILK COMMISSION.

By Dr. Albert P. Norris, Inspector of Milk of the City of Cambridge.

Mr. President and Gentlemen:—

When Dr. Durgin asked me to report briefly what Cambridge was doing in the direction of certified milk I earnestly begged off, feeling that we were just starting and thus far were without extensive practical results.

In deference to his wishes, however, we will gladly run over the history of our Cambridge undertaking, which, in its limited way, is part of the fruit of our aggressive State Secretary, Dr. Harrington's crusade for purer milk.

Sometime in December last a meeting of the Boston Medical Library Association was devoted to this Pure Milk Problem.

Dr. Goler of Rochester, N. Y., explained the Rochester idea, where, by the establishment of municipal infant-feeding dispensaries of sanitary milk during the hot summer months Rochester had reduced her infant mortality about 60 per cent. since starting nine years ago.

Dr. Pearson of Cornell University was the next speaker. He outlined the methods needed to carry on a dairy in a conscientious cleanly way.

Lastly Dr. Harrington gave a telling paper upon the Sanitary Importance of Clean Milk. How manure is simply teeming with myriads of tiny bacteria from the intestines of the cows, and how unless particular pains are taken to thor-

oughly groom and cleanse the cow many caked particles of dung fall into the milking pail, serving as seed which grow rapidly when the milk is improperly cooled. Further that clean utensils and a persistent temperature less than 50 degrees Fahrenheit must be maintained to hold back bacterial growth and thus ensure sweet, clean wholesome milk. Dr. Harrington went further, describing other types of bacteria which mere negligence often allow to gain entrance into milk and which affects infants with disease and distress.

Infant mortality rates were noted in our leading cities and Massachusetts is shown as having six cities with rates above one death to five births, while Cambridge and Boston are very close to that high rate.

Let me state here that Dr. Rose of the State Board is doing a most valuable work inspecting each farm producing merchantable milk and carefully outlining needed imyrovements; but to obtain milk of highly satisfactory quality two requisites must be fulfilled.

(1) Consumers must appreciate that such milk costs more to produce.

(2) Producers must be conscientious in keeping out dirt and keeping the milk cold. No one who attended that meeting could fail to be impressed with the urgent need of having some commission established which would co-operate with the State and Municipal Inspection, and alike protect the consumer willing to pay for pure milk, and patronize the conscientious producer by certifying such milk.

As spring came on and with it the surety that ice bills were to be high, it seemed probable that milk would be inadequately iced and our community liable to suffer more than usual in those sections using the cheapest milk.

Members of the Cambridge Medical Improvement Society became interested in having available sources of milk which could be unqualifiedly recommended and a meeting was devoted to a discussion of the Cambridge conditions.

At present the Cambridge milk supply of 10,000 gallons

daily comes from three groups: 150 cows within her borders; from about 150 suburban farms yielding one-third our supply, and the largest part, almost two-thirds of the whole, comes in common with the Boston supply over the railroads centering there.

Cows kept within our borders are in small herds, many of them for private use. All dispense their milk within a few hours after its production.

The suburban farms usually sell their milk to a middle man who bottles and retails the milk, usually 36 hours old, and very similar in character to that of the next group, the Railroad or Contractors group. These gentlemen have a gigantic task in collecting from an ever increasing circle of farms, milk which may be transported and sold still sweet and palatable 36 and more hours after it is produced. It may be said that the contractors are steadily working to improve farm dairy conditions, but their field is very large and old Yankee prejudices against innovations are hard to overcome.

The neat establishments of most of the contractors are in a good condition of cleanliness and equipped with most ingenious appliances for the rapid conveyance and bottling of milk.

As we looked over the above groups of farms we found *very* few farms sending milk directly to the consumers. In practically all cases the milk of several or many dairies is mixed by the wholesaler or middle man before delivering it. Secondly, comparatively few farmers have ice with which to cool their milk. Springs and wells at a temperature of from 55 to 60 degrees Fahrenheit during the summer months are entirely inadequate to prevent the rapid growth of germs.

I think you will see the difficulty immediately in endeavoring to certify a milk which passes through many hands and is mixed with that of other dairies, the good ones neutralizing the bad. In dealing with such a perishable food so absolutely dependent upon cleanliness and cold, the hands through which it passes should be as few as possible, and certified milk must

be bottled, sealed and iced at the dairy, thus throwing the entire responsibility of clean production upon the producer. Adequate icing during transportation can be supervised, and until the seal of that bottle is broken a purchaser should be guaranteed the origin of the milk.

At this meeting the Cambridge Medical Improvement Society voted unanimously to establish a Milk Commission of three physicians who should appoint a veterinarian, a chemist and bacteriologist, and should draw up suitable rules for the control of sanitary dairies and certify such dairies when their milk should come up to the standards set by the Commission.

Dr. Swan, the President of the Society, with Dr. F. W. Taylor and Dr. J. F. Fair, comprise the Commission.

A code of rules has been established and the Cedar Hill Farm of Miss Cornelia Warren of Waltham, already one of the largest and best farms in this region, has been improved as follows to meet the requirements of this Commission.

This dairy is more elaborately finished than others, which will accomplish as good results without so expensive an apparatus.

EQUIPMENT: A monitor roofed stable without a cellar was already arranged with two rows of tie-ups with feeding floors facing inward. One thousand cubic feet of air space is allowed each cow and an almost continuous line of windows fill the wall behind the cows.

A large wheeled push-cart is used to remove the manure and shavings used for bedding which sop up the urine.

THE DAIRY is a building with four rooms, a basement and an outside flight of stairs leading to a clean spout which conducts the milk into the clean room of the dairy.

This clean room has a cement floor and tile walls which can very easily be kept clean. In the room adjoining the clean room is a galvanized sheet-iron chest with a door opening the entire end of the chest so as to allow the entrance of a long truck laden with glass bottles, cans, pails, straining

cloths and utensils in any way coming in contact with the milk. After the door is battened, live steam from a boiler in the basement is admitted for twenty minutes at 212 degrees Fahrenheit. Then after gradually cooling down, the utensils are stored in the clean room until wanted.

Each milker grooms his cows each morning, and immediately before milking rubs the udders and surrounding parts with a fine bristle brush to remove coarse hairs and dandruff. Then with a cloth wrung out of clean soapy water he washes off the above parts and dries them tidily with a towel carried in his pocket.

A chain is hooked across the stanchion below the cow's throat to prevent her lying down and dirtying the clean area. So soon as the milker's line of cows is cleaned and throat latched, he goes to the wash-room adjoining the dairy and cleans his hands with warm soap and water and puts on overalls and jumper kept solely for the milking process.

With one of the sterilized milk pans with a six-inch top opening he goes to the barn and sits upon a neat galvanized iron stool which is kept clean so that his hands are not polluted by the mere process of putting it in place for milking. The milking is done quietly and thoroughly. The yield is weighed and noted on the tabulated card; then a carrier takes this pail to the spout outside the dairy; the milker proceeds to another cow. The milk is poured through four layers of sterilized gauze into a hopper which leads into a tin milk tank in the dairy clean room. From this the milk goes directly into bottles, is capped and stood in chopped ice and water. This routine is now furnishing us with a milk with less than ten thousand bacteria per C. C. in these hot days just passed. The Commission feels sure that if eight certified farms can sell their entire production in New York City at fifteen cents per quart, a few such farms should be stimulated about Boston. The Briarcliffe Dairies of twelve hundred registered Jerseys are selling their entire product at fifteen cents per quart in

New York, and their cleanliness is rewarded by bacterial counts that seldom run over five thousand per c. c.

In response to petitions from the Cambridge Medical Improvement Society and the Cambridge Board of Health, the Mayor and City Council of Cambridge appropriated one thousand dollars through its Milk Department and an Advisory Board of five citizens to start a municipal Infant Feeding Plant during the hot summer months. We are fortunate in Cambridge in having a Nurses' Training School where enthusiastic young women are willing to clean and sterilize the bottles and prepare the milk for infant feeding. Also we have an efficient District Visiting Nursing Association whose young women have been willing to run the five dispensing stations for an hour each forenoon, and in case of well babies, without a physician's directions the nurses assign the food of suitable strength and outline to less intelligent mothers rules for the hygienic care of their little ones. A pamphlet aids largely in teaching and impressing on the mother's mind lessons given by the nurses.

At an early hour each morning milk less than twelve hours' old is brought from our certified farms to the training school where suitable admixtures of lime water, sugar, top milk and bottom milk are made and put into small sterilized feeding bottles holding two, four, six and eight ounces respectively. Sterilized cork stoppers close the bottles and they are put in wire racks set in deep wooden boxes and covered with chopped ice. At the present time we are dispensing 350 bottles to about sixty infants. At 8 A. M. these cases are distributed to the five delivering stations where the District Nurses are on duty from 8 to 9 each A. M. to sell at one cent or two cents, according to the size, these bottles of pure milk. On applying for milk the parent must either bring the request and directions of the family physician or must carry the infant and have it accurately weighed and its condition noted. Subsequently every three weeks the child is weighed and its

progress noted upon cards kept for the purpose, and when needed the nurse may strengthen or weaken the feeding.

So far we have reached sixty infants scattered through all sections of our city, but chiefly in the poorer neighborhoods.

Simultaneously we have obtained one dairy with a maximum content of 100 cows, cleaned up to a high standard. The former bacterial counts of 200,000 to 500,000 and even more bacteria are now reduced to less than 10,000, and two other farms already very good according to old standards will in the near future be sending milk to the city from herds maintained in a reliable sanitary condition. In justification of this campaign we can merely say our State Board has pointed out the lines of needed reform and Cambridge is endeavoring to do her duty.

THE PRESIDENT: The next paper is by Dr. Morse of Boston. The subject: "The Projected Work of the Milk Commission of the Suffolk District Medical Society." I have the pleasure of introducing Dr. Morse.

THE PROJECTED WORK OF THE MILK COMMISSION OF THE SUFFOLK MEDICAL SOCIETY.

By Dr. John Lovett Morse of Boston.

A committee was appointed by the Suffolk District Medical Society to report upon the expediency of establishing a milk commission under the direction of the society. This committee consisted of Dr, Charles Harrington, Dr. Samuel H. Durgin and Dr. John Lovett Morse. They reported in part as follows:

"The attention of the public has repeatedly been drawn to the connection betwen ordinary market milk and the high rates of infant mortality, especially in urban communities, and the importance of a clean milk supply is now being rec-

ognized not only by the medical profession but by the more intelligent of the lay public.

While the producer of a clean, and, therefore, wholesome milk supply is put to greater expense in maintaining his plant, he competes on equal terms with the dealer in milk containing pus, cow dung and other contaminations, and receives the same price per quart. There are, in this immediate neighborhood, a number of persons who maintain scrupulously neat dairies and produce milk which is free from bacteria as constant care and watchfulness can make it, and doubtless, there are others who will go to larger expense for help in the running of their dairies were there any hope of public recognition of the fact that, even at a higher price per quart, clean milk is much cheaper in the end than dirty milk.

At present the public have no means of knowing of whom they can secure milk fit for human consumption, and, especially, adapted to infants during the perilous months of hot weather.

In a number of cities, both in this country and abroad, milk commissions have been appointed to issue certificates to those whose premises, cattle, methods of production and product conform to certain standards of sanitary excellence. The certificates issued grant permission to recipients to advertise the fact that their milk has been certified by disinterested persons as being produced under proper sanitary conditions, and conforming in chemical composition to established standards. The right, so given, is for a limited time only, at the expiration of which, further examination must be made in order that the certificate may be renewed.

In the belief that in no other way can the question of a pure, clean, sanitary milk be better promoted, however, and an improvement in the rates in infant mortality be secured, your committee recommends the appointment of a commission, to consist of not more than five physicians, to be known

as the "'Milk Commission of the Suffolk District Medical Society.'"

It was voted by the society that such a commission be established. It was further voted, the members of such commission shall serve without compensation; they shall make such rules and regulations concerning certification as, in their discretion, they may deem proper; they shall fill any vacancies that may occur in their number; they shall make such arrangements to secure such competent gratuitous veterinary, chemical and bacteriological service as may be available; and they shall submit annually a report of their doings for the preceeding year.

The Chairman of the Suffolk District Medical Society appointed as this commission Dr. John Lovett Morse, chairman, Dr. E. P. Joslin, Dr. E. A. Locke, Dr. F. H. Slack and Dr. Wilder Tileston.

This commission, when it came together, found on looking the field over that there seemed to be three general ways of improving the milk supply of a community.

The first was by the establishment of such general rules and regulations regarding the milk supply of the city as could be taken by a State Board of Health or by a City Board of Health, and which improved the whole milk supply of the city; not making it ideal or even approximately ideal, but making it better. It seemed to the Commission that this field did not belong to them but did belong to the State and City Boards of Health. As you all know, of course, a great deal is being done by both the State Board of Health and by the City Board of Health of Boston to improve the milk supply of the city of Boston and also of the State as a whole.

Another way in which the milk supply could be improved seemed to be by the establishment of a farm under proper conditions and control, and the distribution of the product of that farm to poor people at a nominal sum, as is being done in Rochester and as is also being done in Cambridge as Dr. Norris described. It seemed to our Milk Commission, again,

that that was not the best thing for them to take up at first; but that it should be left until later and then taken up if it seemed best.

The third method of improving the milk supply seemed to be by establishing rules and regulations for the production of milk and by the certification of the product of certain farms to get what might be called a perfect milk, that milk to be sold at a large price to people who were able to pay for it. Now, that of course is rather a limited field. It does, however, fulfill certain of the objects which are spoken of in the report of the committee. It furnishes an ideal milk. That ideal milk serves as an example to others as to what an ideal milk should be. It serves as an example to other farms and other milkmen and milk contractors, and more especially to the public, as to what proper, clean, ideal milk is. It also enables the public to get a proper, ideal milk, if they are willing to pay for it. It also educates the public up to a knowledge of the fact that you cannot get a clean milk without paying for it any more than you can get a first-class product of any other sort without paying for it. It is going to teach them that they cannot get milk for 8 cents a quart that is ideal. They have got to pay at least 15 and perhaps more.

After having decided to take up that line of work, there seemed to be two lines open. One was to make very definite, hard and fast contracts with one or more farms as to just exactly how that farm should be managed in every detail, as to the care of the milk and so on, as is done in Newark and certain other cities. The other way seemed to be to establish a high standard, so high that the milk would have to be produced under practically ideal conditions in order to fulfill the conditions of the standard, and then merely to certify the product, having only a general supervision over the production of the milk. It seemed to us that the latter was the better plan to adopt, and we have drawn up the following provisional requirements for certified milk; that is, the requirements have

not been definitely settled as yet, but will probably be but slightly modified.

THE REQUIREMENTS FOR CERTIFIED MILK.

The Milk. The milk taken from the delivery wagon must fulfill the following conditions: 1. It must be free from pus and pathogenic organisms and contain not more than ten thousand bacteria to the cubic centimetre. (I would like to say here, parenthetically, that I wanted it 5000 bacteria to the cubic centimetre, but was voted down.) 2. The reaction shall be neutral or slightly acid. The milk shall contain not less than 3 per cent. nor more than 4 per cent. of proteids, not less than 4 per cent. nor more than 5 per cent. of sugar, and not less than 3.5 per cent. nor more than 4.5 per cent. of fat. (A uniform low standard for fat was established in order to provide a constant milk for the modification of milk for babies. It is probable that it will also be advisable to certify milk containing more than 4.5 per cent. of fat for the use of older children and adults.) It must be free from preservatives, coloring matters and other contaminations and it shall not have been subjected to the action of heat. The milk shall be cooled to a temperature of 45°F. within one hour of the time of milking, and shall be kept at this temperature up to the time of delivery; it shall not have been frozen. 3. Milk shall be delivered in glass jars hermetically sealed in a manner satisfactory to the commission.

The Dairy. The barn where the cows are kept, the dairy and the surroundings must be in a clean and sanitary condition satisfactory to the veterinarian employed by the commission. The cows shall be healthy and free from tuberculosis; each animal shall have been shown to fail to react to the tuberculin test both before its admission to the herd and at least once a year thereafter.

The employees shall be healthy and cleanly in their persons and habits. They shall not suffer from, nor have been recently exposed to, any infectious disease..

Inspection. The milk from each dairy certified by the commission shall be examined at least once each month both bacteriologically and chemically. Samples for examination shall be taken from the delivery wagon without previous notice to the proprietors.

In case an examination shows that the milk does not fulfill the conditions set by the commission ,the dairy may have a re-examination made within a week or within a short time, at the discretion of the commission.

Each dairy furnishing certified milk shall be inspected at least once a month by a competent veterinarian who is to make a report to the commission of the results of each visit.

Certification. If both the dairy and the milk it produces fulfill the foregoing requirements a certificate shall be issued to the proprietor of said dairy, good for the period of one month, said certificate to read as follows:

Certificate of the Milk Commission of the Suffolk District Medical Society.

(Date)

The Milk Commission of the Suffolk District Medical Society hereby certifices that the dairy of ..... is now fulfilling all the requirements of the Commission both as to the methods employed and the quality of the milk.

This certificate is good for only one month from above date, when a new certificate will be issued if the conditions are still satisfactory to the Commission.

(Signed by the Commission.)

Each bottle of milk shall be accompanied by a certificate slip which shall serve as a guarantee to the consumer, said slip to read the same as the above certificate.

In order to prevent the copying or improper use of certificate slips they will bear a copyrighted monogram.

The certificate slip will also have these words "Notice the date!" If the consumer doesn't have sense enough to notice the date, it is up to him.

We have taken one or two stands rather different from the Milk Commission in other cities. In all other cities, I think, the producer has been compelled to pay for the examinations of the milk and of the farm, making the cost, I think, about $30 a month. That is going to cut a good deal into the profits of producing milk. The Milk Commission of the Suffolk District is not going to charge for the examinations. Through the courtesy of Dr. Harrington of the State Board of Health and Dr. Durgin of the City Board of Health, it is probable that the examinations can be made unofficially by persons connected with those boards of health ,and reported to the Commission entirely unofficially, through the courtesy of the gentlemen themselves and through the courtesy of their boards. The only thing for which the producer will be charged is the slips which go with the milk jars. Those I think will cost about a dollar a thousand.

It is very evident, of course, that the Milk Commission of the Suffolk District is taking a very arbitrary stand. That is, we say, "If you want to produce good milk, we are willing to certify it. If you don't want to, we won't." Now, we trust that there are certain people that will want their milk certified; and we trust that those people will be able to get a high enough price for their milk to make it pay to produce a perfect milk.

The PRESIDENT: The subject of these two papers is now before the Association for discussion. Some allusion has been made to the Association in Cambridge. I see Dr. Swan here, the chairman of that Association. We shall be glad to hear from him.

DR. SWAN: Mr. President,—I came here with no idea of saying anything about our Commission yet, but merely to listen and learn how it is best to conduct our affairs. Dr. Norris has shown you the interest that we feel in Cambridge in the subject of pure milk; and I will only say that our Com-

mission is working on the same lines that Dr. Morse has outlined and that we hope soon to be able to show material improvement in some of the farms in regard to the production of pure milk.

The PRESIDENT: Dr. Slack, we should be very glad to hear from you upon this subject.

DR. SLACK: Mr. Chairman and Gentlemen: Dr. Morse, I noticed, divided his discourse into three heads, as to the way milk could be improved. First, by municipal and state control; secondly, by establishing certified milk depots; in the third place, by having a high priced certified milk.

Dr. Morse spoke on the last, Dr. Norris spoke on the second, the establishing of milk depots. My work has been connected more with municipal control, and I think perhaps a few words along that line would be more interesting to you than on the other matters which have been so fully described. In approaching this subject we find four general methods by which the milk supply as a whole can be greatly improved: The first way is to improve the production at the farms. The second way is to have milk cooled as quickly as possible and to keep it that way until it is delivered to the consumer. The third method is to insure as quick a delivery as possible to the customer; and the fourth way is to have great care taken of the milk with respect to its handling by the middlemen, those who handle it in the stores, etc. I believe that there is room for improvement on all these lines. Some of these methods which I will suggest for the improvement of milk are somewhat revolutionary in their character; but this is a subject of such vital importance that I believe we should be willing to revolutionize the existing conditions if by so doing we can save many lives. If, upon a grade crossing in a city, a single man is killed, the attention of the entire community is brought to the fact, and probably the railroad, at great expense, is forced to abolish that grade crossing.

But hundreds of children may be killed by impure milk, and very little attention is paid to the matter, because it is not brought so much to the public attention. I believe that just as much care and just as much expense should be used when necessary in order that these lives may be saved as that we may save life at grade crossings.

As to improving the production of milk, it is now possible for one man, by examining the dairies as they come in, to examine the samples from one hundred dairies a day and tell whether or not that milk is good. I believe that every dairy that comes into the city should be so examined. The contractors and those who have control of large supplies of milk should be constantly examining these supplies and weeding out poor dairies. For instance, nine-tenths of the milk that comes into the city now is in fairly good condition. Ninety per cent. of the milk, as it has been examined, coming from the contractors, is within our city standards. If this other ten per cent. could be weeded out before the milk is mixed, we would have a greatly improved milk supply. That is the first thing to be done.

As to keeping the milk cold, the city law upon that subject has had great effect in the city as a whole; the milk is now kept below 50 degrees Fahrenheit. But there is still room for improvement on farms. The milk is not cooled at once, but most of it waits for cooling on the cars. I believe if these dairies were examined as they come in, and the poor ones were notified that they would have to cool their milk in order to come within the requirements, there would be great improvement.

As to quick delivery, I believe there is room for improvement along this line. A very small per cent. of the milk as it comes to the city is delivered at once to the consumer. Most of it is mixed and packed away in ice for at least 18 hours. I have been told by the inspectors of other cities that in order to prepare for the increased demand for milk on Saturdays, it is customary to keep the milk another 24 hours, making from

48 to 60 hours before it is delivered. I believe, where there is no question but that this milk may be delivered and used by infants, such delay is little short of criminal. Even at great expense, and even, if necessary, by changing train schedules and things of that kind, this milk should be put on the market quicker.

The fourth point is as to the care of the milk in the hands of the middlemen. That is where the greatest reform should be made. We have, for instance, in Boston 3,800 licensed milk dealers. We can buy milk from the butcher, we can buy milk from the baker, from the grocery store, the candy store, the lunch room; we can buy milk almost anywhere. In some sections you can stand and see a dozen places within a radius of a few hundred feet where milk can be purchased. These stores are kept by all kinds and conditions of people. There are lots of good, clean, respectable people who keep their milk in a proper manner. There are lots of people who would like to keep their milk in a proper manner, and do not know how. And there are plenty of people who wouldn't keep the milk in a proper manner if they did know how. It is my personal opinion that the milk should be taken from all these stores, that they should not be allowed to sell milk. If, instead of that, say 100 or 200 milk stations were established throughout the city, where the milk would be under the care of people who knew how to handle milk, it would be a great advantage. If you could reduce the number of places where milk was sold to that number, they could be subjected to a rigid inspection by the Board of Health. These places could be visited almost weekly, and they could be forced to keep their milk as it should be kept. Keeping milk in this way would probably result in an increase in the bottle trade, and perhaps in a decrease in the amount of milk sold. But I believe it would be a great benefit to all concerned and would result in a decrease of the mortality rate.

The PRESIDENT: Everything that has thus far been

said upon this subject points to a public control. The city of Worcester has given the control of its milk supply practically to its Board of Health, and our very energetic associate, Mr. Coffey, can tell us how they are doing it, I think.

MR. COFFEY: Mr. President,—I can hardly do that now, because the control has only just been turned over to us. The legislature of 1906, in the closing days of the session, passed an Act transferring the milk inspection to the Board of Health. Now we are interested, as a board, in finding out what are the reasonable requirements that we may ask without imposing unnecessary burdens on the farmers. The requirements, I mean, are with respect to what they shall do in order that proper milk may be sold at a reasonable price to the greater proportion of the community. Now 15 cents a quart or 20 cents a quart is simply prohibitive as far as the great bulk of the community is concerned. In Worcester the retail price of milk is 6 cents in summer and 7 cents in winter. And when milk dealers talk of raising it above that price, the people are very much concerned and restive and object rather strongly to paying more than 7 cents a quart for their milk.

Now, of course, the farmers have their side of the question. As an official, I want to do what I can to improve the milk supply of the city of Worcester and to make it as nearly pure and healthful as it can be made. And, at the same time, I recognize the fact that the farmer has his side of the question. Personally, I do not believe there are any people in the community who work harder, more hours, in all kinds of weather, than the milk pedler in the average city. You must remember that outside of Boston the milk of the various cities is supplied by the surrounding towns. In Worcester the milk is almost entirely supplied in that way, by the men who produce it themselves or who purchase it from their neighbors. These men get up at midnight or one o'clock in the morning and collect their milk, and by three o'clock they are on their way to the city. They are in the city by half past three or

four o'clock. And any one who is driving along the roads leading from the city—this is true of Worcester, and I haven't any doubt it is also true of the smaller cities of the State and perhaps of all the cities with the exception of Boston which gets its supply from distant points by railroad—in the smaller cities, anybody who has been about on the roads leading out of the city along about ten o'clock or half past ten has seen the milkmen on their wagons, asleep, and the horse proceeding on his way homeward. It is eleven o'clock or perhaps later when that milk pedler reaches his home. Then he has got his ordinary duties to perform on the farm; and he must be in bed by seven or eight o'clock at night in order to get a small amount of sleep. He is out in all sorts of weather, rain, wind and sleet and snow and ice. And I think that he has a side of the question. My interest is, to find out what are the reasonable requirements that we may exact from the milkmen, and at the same time protect ourselves. In other words, what ventilation ought a dairy barn or a cow barn to have, what are the conditions, how many cubic feet of space should be allowed to each cow, what should the conditions be with respect to the flooring, what should the conditions be with respect to light; I mean, the conditions that are reasonable, not ideal. We all know what the ideal conditions are, or at least we can imagine what they might be if we had unlimited money and there was no question as to the cost of the production. But the thing that I, as an executive officer of the Worcester Board of Health, am interested in, is, what may I say to a dairyman that produces the milk that comes into Worcester, that he cannot object to as a reasonable requirement. That is one of the things that I am particularly interested in.

Another thing that has suggested itself to me is the question whether 500,000 bacteria to the cubic centimeter are too many to allow? Those who have had the matter in their charge longer may perhaps be able to answer that question. Can milk be produced under reasonable conditions, not at

too great a cost, so that it can be put into the city with a less number of bacteria than 500,000 to the cubic centimeter?

What are the reasonable requirements that we may exact of store-keepers who have milk to sell?

Those are the practical questions that, as a health officer, I am interested in. What can we reasonably ask of the producer and the distributer in order that we may have pure milk without putting burdensome conditions upon him that will necessitate his putting the milk at a price that places it beyond the reach of the average family? If there are any here who have had that experience and can answer those questions, I should be glad to hear from them, because those are the things that I am interested in,—not so much in the ideal conditions, because the people who can afford to pay for ideal conditions can be trusted to take care of themselves as a rule. It is the great bulk of the people, the poor people, to whom an extra cent a quart for milk a day is a burden, who are to be considered. And all we expect to require, all we should require, it seems to me, as public officials, is that the milk shall be furnished reasonably clean and pure and that reasonable precautions shall be taken by the producer and by the distributer in order that the people may have that most important of all foods, pure milk.

THE PRESIDENT: No one has had more to do with voluntary association for the protection of our food supplies than one of our members now present. I am going to ask Mrs. Richards to say something to us upon this subject.

MRS. RICHARDS: Mr. President,—in regard to this question, I think a great deal of the difficulty at present is owing to the fact that the care of the milk supply at the farm has been taken naturally, in the large way in which milk is furnished, from the care of the farmer's wife and put into the hands of the farmer's hired man. So I should say the first thing to do is to encourage an oversight from the

woman's point of view in the way of cleanliness. I feel with Mr. Coffey, very strongly, that we are putting a great burden upon the people in charging such a high price for milk, and that a little more care, a little more cleanliness in the dairy, will go a very great way. And I believe in a campaign of education among the farmers, as to the way dirt affects the milk, and especially in the encouragement either of the farmer himself or of the farmer's wife to look after some of these details. That is the main line that I feel we can work for in the country towns. Many failures are entirely from ignorance. The people have no idea where the difficulty lies. And, of course, we must use every possible means of spreading our belief in the value of clean milk. I am sure the farmer will meet the people halfway if he can be shown, as Mr. Coffey says, how to do it. And then the rest of us in the cities must be educated up to paying a fair price. And there I must say I think the housewife should be educated. She should be educated to know what is really worth paying for, and pay for it, in this line as well as in any other. We make nothing of paying a high price for cream; and we ought to learn, I think, what really clean good milk is worth.

THE PRESIDENT: There is one man fortunately in this hall who knows more about milk probably than all the rest of us put together. He has analyzed more milk and seen more milk than any of us. And that is the milk inspector of the city of Boston. I am going to ask him to answer some of these questions,—Mr. Jordan.

MR. JORDAN: Mr. President,—Here in Boston our trouble at the present time is mainly due to two conditions: One is a few very bad dairies; and the other is the age of the milk. But we have a problem which is different from that of most cities. Our milk comes from a wide range of territory. We have milk arriving here from New York, Ver-

mont, New Hampshire, Maine and Connecticut, besides that produced in this State. And it is a difficult problem even for the contractors to have control of all the farms producing this milk, especially when they are located outside of Massachusetts. However, I think that we are making progress, and these movements for certified milk are for the betterment of conditions. I believe there will be no trouble in getting certified milk when the public is willing to pay for it. But at this time I do not think that enough individuals will purchase it to make its production a financial success.

One great difficulty in Boston is with the store milk. The milk from wagons comes fairly well within the requiremnets of the Boston Board of Health. But the store milk is the oldest milk and has the most handling. It is turned from cans the outside of which may not be over clean, into milk crocks, and is subjected to conditions of dust and dirt in the store, which tend to make it poor. But I think we are making improvement along that line, and within a few years anticipate greater progress. I believe that in a short time many of the small stores where one or two 8 1-2 quart cans are sold daily, milk will be retailed in bottles, and it will be left with the storekeepers by milkmen in bottles, quarts and pints, and that the store people will sell this bottled milk to customers, instead of measuring out the milk as at present.

I agree with Mr. Coffey that the milk dealer is a very hard worked individual; and I also want to call attention to the fact that the milkman of the present day is very different from the old-style milk dealer. Many of the former milk dealers have been driven from the business. Their methods were not such as to commend their product to citizens; and they were law violators. But at the present time many of the dealers supplying Boston with milk are progressive men; they are trying to improve their product and I believe they are giving the citizens a better article of food than formerly.

I think this movement for certified milk is a very good

one and I hope there will be no difficulty in coming within the proposed standard for bacteria.

THE PRESIDENT: Dr. Peters, I think you are the man to tell us something about the condition of the cow in Massachusetts, which is responsible for this business.

DR. PETERS: Mr. President and Gentlemen.—I came here to-day to listen and learn, not to speak. I think we shall be glad to hear from the farmers' side of the question; and we have the largest cattle owner in Massachusetts here, who conducts one of these model dairies, and I would like to give way to Mr. Geo. H. Ellis, who is producing milk under the ideal conditions that have been spoken of with respect to having healthy cows, keeping them clean and cooling the milk which is drawn from the cow and putting it in glass bottles and delivering it directly to his customers without the intervention of the middleman. I would be very glad to give way to Mr. Ellis.

THE PRESIDENT: Dr. Peters has, in a very cowardly fashion, escaped from his responsibilities. I was going to call upon Mr. Ellis, myself; but I do not propose that Dr. Peters shall shelter himself behind any such ignoble excuse. We shall be very glad indeed to hear from Mr. Ellis and very glad to hear from any of our friends who are producing milk.

MR. GEORGE H. ELLIS: Mr. President, I am sorry Dr. Peters should have turned the subject over to me, because I think he could give more information perhaps than I could. He says I am producing milk under ideal conditions, and I do not plead guilty to that. I am trying to, but I find how difficult it is. And it seems to me that just now the thing that needs to be taught our people more than anything else is the absolute necessity of paying a higher price for milk. You are asking the farmer to supply his milk at practically the same price; you are asking the retailer to supply it at

exactly the same price as he has been doing in our cities for years; and yet the cost to the producer is tremendously increased. We have had the cry—and it was a legitimate one—for years past, that the farmer could not live on the price he was getting for his milk. And yet you are asking him to take the same price to-day, when every expense has gone up.

Mrs. Richards speaks of the transfer of the care of the milk from the farmer's wife to the hired man. But that is coming back pretty fast, for you cannot get the hired man. If the farmer's wife does not take care of the milk, it won't be taken care of. The help problem is a very serious problem on the farm; it is practically impossible to get men who will take proper care of milk. If we reach the point that we seem to be nearing now, of the milking machine, that is going to help very materially to settle the whole question,—not the whole question but the producer's question, because, if the milk machine is as satisfactory as has been promised, it will largely take care of the question of bacteria, with reasonable care only of the cow. Now it takes what the old farmer would consider and does consider unreasonable care, to give us the milk that we want. And that does cost him a lot of money. The milking machine is going to cost money, it is true. But if that comes into use, as now seems probable, I think the production of milk will gradually drift away from the small farmer and from the man who is producing his one or two or three cans under what you would call normal conditions, to the larger producers, because the milking machine can hardly be run to advantage with a small herd of cows. But with a herd of fifty and upward, if it works satisfactorily, you have removed this danger of contamination, providing your cows are reasonably well taken care of, and have reduced the cost of handling that milk from the cow to the consumer very materially. I say reduced it,—no, I don't know that I would say that, because when you come to the use of milking machines, you have got to have a higher or-

der of intelligence, if not of cleanliness, in the handling of the machine and in the handling of the cows. But while the cost, as against the present cost, may not be reduced, the cost of producing milk that is at least reasonably pure will be reduced.

But, as I say, one of the first requisites is that the farmer shall receive a reasonable price for his milk. Now, while I am, as Dr. Peters intimated, trying to produce a strictly sanitary quality of milk, I am more interested in the production of milk along the line outlined by Mr. Coffey, the milk that is to be used by the ordinary people. And I have found from experience that it is impossible to produce and sell milk under such conditions as I am producing it, of the quality that we are producing, and sell it in our immediate vicinity for less than ten cents a quart. Now, I am making, as some of you know, a high grade of milk, averaging about five per cent. butter fat. Whatever may be said and whatever has been said by some specialists to the contrary, that does increase the cost of your milk. You cannot make a five per cent. milk at the same price, other conditions being equal, that you can a four per cent. And I think it might be possible to sell a milk in the neighborhood of four per cent. in one's own vicinity for less than ten cents a quart. I don't believe that with such care as most of you gentlemen would call proper care, that milk can be sold under such conditions as we are laboring under, at much less than ten cents. I should say that in our smaller cities, in the vicinity of good dairy farms such as we have near Worcester, possibly that price might be reduced a little. But if the food value of milk is what our scientific men claim for it, then why should we not encourage the paying for that milk a price somewhat commensurate with the same food value in other things? And when you get there, then your producer can afford to produce it, and your middleman can afford to handle it. But you must pay for milk somewhere near what it is worth for food, and then encourage its use; increase the care, give us

pure, clean, wholesome milk and encourage the larger use of it against the higher priced foods. You can then produce and sell, on the larger output, at perhaps a less price than you can now. But do not kick the farmer. Pay him a fair price for his milk, and he will come up to your requirements.

THE PRESIDENT: The Association, I know, would be very glad to hear from any other of the many producers who happen to be present. I do not, myself, know them all by name, but I hope some of them will volunteer to say something upon this subject.

MR. HOOD: Mr. President:—Since I have listened to what has been said about ideal milk production I have been thinking of the condition of milk twenty or twenty-five years ago. I remember very clearly, about twenty-five years ago when the weather was extremely hot, perhaps something as we have had it for the last ten days, coming to Boston from New Hampshire on a milk car, and there waiting on milkmen or milk pedlers. The milk supply was short at the time, as it is likely to be during extremely hot weather, and about noon or nearly time for the car to leave Boston, a large dealer in milk came to our car to ask if we had any milk—rejected milk or milk of any kind which we were to take back into the country. We had some rejected milk left, and I remember very clearly my surprise when he bought the entire quantity, learning that it was not bonny clabbered.

The cream was quite thick, and this he turned from the top of the cans into a separate can, making cream for his cream trade, whatever that trade might be. The remainder of the milk he put in other cans, adding a preservative in the form of a powder, to which I think coloring matter had been added. He also added water enough to make a solution to satisfy his idea of milk. That milk, of course, went by his delivery team to his customers in Boston; that is, he deliv-

ered it to the stores, and from there it was without doubt sold to be given to many babies.

The condition of the milk in the market to-day is entirely different. I wish you could see the difference as I see it. We come here to-day and talk about ideal milk. But the ideal of to-day will not be the ideal of tomorrow. If, twenty or twenty-five years ago, any dealer had put out or delivered to his customers the milk that is being delivered to-day, we really would have thought people would live forever. The change is coming gradually, and there is a great deal of credit due to the Board of Health and to the inspectors of Boston and vicinity. I am pleased to attend such a valuable meeting, and those interested in the milk business will also be interested in what has been said here to-day, and in carrying into their own business the thoughts and ideas which you have advanced.

MR. S. C. KEITH: Mr. President, there is one point that has not been brought out to-day as yet I believe and that is the fact that the greater part of the milk consuming public are poor people who buy milk in stores and from wagons and who do not take proper care of it after they get it. Very many poor people to-day are not buying ice at the existing high prices; and they buy milk which may be perfectly good when they get it, and feed it to their babies for the ensuing twenty-four hours during which time it must, of course, become unfit for food. It seems to me a great deal of good work could be done by instructing the general public through boards of health and physicians, to take proper care of the milk after they receive it so that it may be kept in good condition for use until the next supply is bought.

MR. WHITAKER: Mr. President,—considerable has been said about the work of the State Board of Health and the City Boards of Health. But it may not be known to all the members that even the National Government is taking

considerable interest in the milk supply of the country, and, through its dairy division, is doing quite a little work along that line. At the recent dairy exhibition in Chicago there was a competitive exhibit of samples of milk, similar to the butter exhibit that has been held a great many times. Samples of milk from various parts of the country were exhibited. And, if my memory serves me right, a Massachusetts sample took one of the honors, a sample presented by Mr. Hood, who has spoken here to-day. The national dairy division is also doing something to help the milk question by investigations in different cities and by the publishing of bulletins, so it is possible for the people of one city or state to know something of the work that is being done in other states and other cities, acting as a sort of clearing house of information, as it were. There is just now going on in Pennsylvania a work of so much importance that the national dairy division has undertaken, in a way, a sort of inspection or supervision of it for the good of the cause generally, which is of interest possibly. A corporation of milk consumers has been organized in the city of Bradford, Pennsylvania, for the purpose of supplying themselves with milk under ideal conditions; and, without going into the details at all, they propose to buy the milk of such farmers as will produce milk under ideal conditions; and to act through their executive officers as middlemen under ideal conditions. And what profits there are will go to them in getting a perfect milk supply. The proposition is somewhat altruistic possibly; but it is so novel that the national dairy division has thought it wise to have an eye out to see what it amounts to; and, if it amounts to anything, it will publish information about it for the benefit of the people of the country generally.

THE PRESIDENT: The next paper in order is a paper upon the "National Pure Food Law and Its Possible and Probable Influence upon the Food Supply of Massachusetts," by Dr. Charles Harrington of Boston. Dr. Charles Harring-

ton is not able to be here this afternoon, and Dr. Magrath will read his paper.

THE NATIONAL PURE FOOD LAW.

By Dr. Chas. Harrington, Secretary Massachusetts State Board of Health.

THE NATIONAL PURE FOOD LAW which is to go into effect on January 1, 1907, deals not only with foods, but with drugs, proprietary medicines, and liquors; and not only with adulteration of the same, but with misbranding. Inasmuch as the States have the right to make their own police regulations in regard to the manufacture and sale of food and drugs within their own boundaries, the provisions of the act apply only to those articles which enter into interstate and foreign commerce and to those produced and intended for sale in the District of Columbia and the several Territories and insular possessions. It does not and cannot interfere with the sale of adulterated and misbranded foods and drugs within the boundaries of the State in which they are produced; but it does prohibit the manufacture, sale, or offering for sale in the District of Columbia or Territories, of adulterated or misbranded foods, drugs, medicines and liquors, and the shipment thereof from or to any State, Territory, district, or foreign country; and imposes heavy penalties—fines, imprisonment, or both—for the violation of its provisions. And any person, who, after receiving such goods from another State, Territory or district, or foreign country, delivers or offers to deliver the same in *original unbroken* packages, or sells, or offers to sell in the District of Columbia or any Territory, or exports or offers to export the same to countries in which their sale is prohibited, may be punished by fine or imprisonment or both.

While the sale of these articles at retail or wholesale is prohibited where Congress has exclusive jurisdiction, it is

only in original unbroken packages that their sale is prohibited within the several States, and then only in the States within which the same are *not* produced. Thus, adulterated maple sugar, produced in New Hampshire, may be sold at wholesale and retail in New Hampshire without breaking the National law, and if introduced into Massachusetts and removed from the original package it may be sold at retail without violating any of its provisions, though contrary to the State law; but it may not be disposed of in Massachusetts in the original package without breaking both laws, and also it may not be exported to a foreign country.

In case of violation of any of the provisions of the law, the results of the examination made under the direction or supervision of the Bureau of Chemistry of the Department of Agriculture must be communicated to the person from whom the sample was obtained; and he may be heard, under such rules and regulations as may be prescribed by the Secretaries of the Treasury, Agriculture, and Commerce and Labor, to whom the carrying out of the provisions of the law is entrusted; and if the Act appears to have been violated, the facts must be certified to the proper United States District Attorney for prosecution without delay.

The Act defines drugs as all preparations included in the United States Pharmacopœia and National Formulary, for internal or external use, and any substance or mixture of substances intended to be used for the cure, mitigation, or prevention of disease of either man or animals. It defines foods as all articles used for food, drink, confectionery or condiment by man or animals, whether simple, mixed, or compound.

A drug is deemed to be adulterated, if when sold under a name recognized by the Pharmacopœia, or Formulary, it differs from the established standard, except that its true standard may be stated on the label, even though not in agreement with that of the Pharmacopœia or Formulary.

Confectionery is deemed to be adulterated if it contains

any barytes, terra alba, or chrome yellow or other harmful color or flavoring material, or any spirituous or vinous liquors, or any narcotic drug.

The definition of adulteration so far as relates to foods is practically the same as in our own law, except that in the matter of preservatives, the National law permits their use only in such a way that they can be removed mechanically or by maceration or otherwise before the food is used; and the directions for removal must be printed on the package or on its covering.

A very important part of the law is that which relates to misbranding of foods and drugs; that is, labelling a package in such a way, by statement, design, or device, that the customer will be misled in any particular, including even statements concerning the State, Territory, or foreign country in which it is manufactured or produced; and neither food nor drug may be sold under the name of another article, or if any part of the contents of the package has been removed and replaced with something else, or if the label fails to state the amount and proportion of any alcohol, morphine, opium, alpha or beta eucaine, cocaine, heroin, chloroform, cannabis indica, chloral hydrate or acetanilid or any derivative or preparation of any such substance contained therein.

Foods containing no harmful substances, but yet adulterated in the ordinary sense may be sold if marked "Compound", "Imitation," or "Blend." This proviso is evidently intended to meet the objections of the makers of blended whiskey, who have been strenuous in their opposition to the bill from the very first. The clause containing this proviso says that a "blend" means a mixture of like substances not excluding harmless colors and flavors.

As with our own law, the disclosure of trade secrets is guarded against, and no formulas of proprietary foods are required, except in so far as they may be necessary to secure freedom from adulteration or misbranding.

It is provided that no person shall be prosecuted if he can

establish a guaranty signed by a wholesaler, jobber, manufacturer, or other party, residing within the United States, from whom the article in question was purchased, to the effect that the same is not adulterated or misbranded; and then the maker of the guaranty becomes amenable to the law.

It is further provided that any adulterated or misbranded food, drug, or liquor, in transit from one State, Territory, the District of Columbia, or insular possession to another, there to be sold, or, having been transported, remains unloaded, unsold, or in the original unbroken packages, or for sale or offered for sale in the District of Columbia, or territory, or insular possession, or imported from a foreign country for sale, or intended for export, may be seized, confiscated and condemned, and be destroyed or otherwise disposed of.

It will be observed that in no way does this bill conflict with the State law or render the same inoperative in any particular. So far as foods are concerned, its tendency will be to prevent the introduction of adulterated goods from outside the State. In a way this is hardly necessary, inasmuch as our own law prohibits the sale, after introduction; but though not strictly necessary, it can be helpful.

The most important portion of the law, so far as Massachusetts is concerned, is the very admirable provision relating to the labelling of patent medicines. Herein the law goes much farther than that which was enacted by our own Legislature this year, in that no amount whatever of the drugs mentioned may be present and not declared on the label; whereas in our own law, not inconsiderable amounts of morphine or opium, and large amounts of alcohol may be present without notification. The National law will bear down hard upon "Peruna" and other alcoholic beverages which masquerade as medicines. It is pleasing to note that acetanilid is included among the drugs whose presence must be made known on the label. In view of the fact that acetanilid preparations are extensively advertised, and samples are distributed from door to door

like handbills and other advertising material, and of the further fact that the death-roll from the use of these compounds is increasing all the time, it may be said that this clause of itself makes the law worth while.

In its original form the pure food bill was not all that could be desired, and gave rise to feelings of apprehension that local authorities might be interfered with in the exercise of their duties. In the form in which it was finally passed, it would appear that all of the original objectionable features have been eliminated. Instead of being hampered in its work, the labors of the State Board of Health may be lightened by having a smaller amount of adulterated goods from outside the State to look after, and in the matter of patent medicines, the State is a very great gainer.

THE PRESIDENT: Is there anything to be said upon the subject of the paper that has just been read to you?

DR. DURGIN: A member of the Association has sent a question, asking me to read and answer it. I would consent only from the fact that it can be answered with considerable brevity. Certainly so far as I am concerned I should make it brief. The question is:

"In view of the serious nature of the disease, why should not needy patients ill with advanced pulmonary tuberculosis, who go to a hospital for the protection of the public health, be exempted by the Public Statutes from pauperization if they cannot pay the charges for such hospital care, just as patients with diphtheria or scarlet fever in like circumstances are exempted?

"Second, if it is just and expedient that advanced tubercular patients should receive the same exemption from pauperization under the same circumstances as diphtheria and scarlet fever patients receive it, should not this Association take the necessary steps for securing the requisite legislation?"

Personally, I see no reason why the tubercular patient in an advanced stage, obliged to go to the hospital, should not be as free from pauperization in consequence of such hospital treatment as a person suffering from any other infectious disease. I can conceive of a question being raised in the community as to whether it is worth as much to spare a tubercular patient from pauperization, considering a smaller degree of menace to the public than from a diphtheria or scarlet fever patient,—I can conceive of such a reason being set up. I doubt, myself, the reasonableness of this objection. Yet, if legislation is sought, I think it would be much safer to put the immunity upon those who are obliged to go to the hospital under the order of the Board of Health.

Inasmuch as this is a representative body of men who will have to deal with this question,—I see no reason why they should not express their views, and, if necessary, appear before the legislature in behalf of such legislation.

DR. DAVENPORT: Mr. President, I would like to ask a question. It was my impression that a person was not pauperized who received help from a hospital unless he received help from a fund especially devoted to use as a poor fund. If he received help from a hospital or from any other appropriation made for the Board of Health, it was my impression he was not pauperized. It is my impression that is the law.

DR. DURGIN: I am not prepared to speak positively upon the question raised, but it is my pretty firm belief that all become pauperized if aided by any town or city funds.

MR. COFFEY: Mr. President, I want to say that I do not think there is any question but that these people are pauperized, whether they are aided by the Board of Health or by the Overseers of the Poor; because we have at Worcester a hospital under our direct control, for the care of diphtheria and scarlet fever patients; and until that Act was passed

eliminating those patients from being pauperized, they were pauperized and were carried on the books as paupers. I had a hand in getting that Act passed because I believed that it was unfair to remove those patients to an isolation hospital for the benefit of the public and thus pauperize them. But they were pauperized. And they were aided by the Board of Health directly and out of the Board of Health appropriation. They were pauperized until that Act was passed which prohibited their being pauperized.

MR. NEWCOMB: Mr. President,—does not the law state that it is incumbent upon the Board of Health to provide for the protection of the health of the community by taking care of a person who shall become ill with a contagious disease, by providing a hospital and nurse? Is it not incumbent upon a physician, when he goes to a case of infectious disease immediately to report it over his signature, and for the householder to report the same, under penalty? And does not the law distinctly state that whenever a patient is suffering from a contagious disease dangerous to the public health, special provision shall be made for his care, which shall be at the expense of the individual or of the city or of the town where his settlement is; or, if there be no settlement, then it is a State case? Does not the law particularly state that the expense incurred by the same does not pauperize? I do not know where that law has been repealed. That is the thing in a nutshell, it seems to me.

MR. COFFEY: Worcester has been working under State laws. And, as Mr. Newcomb has just said, the law distinctly says if any one is aided by a city or town, he is aided by the city of town in which he has a settlement. If he has no settlement in the city or town in which he is aided or in any other city or town, then the State pays the bills, and he is pauperized. That is State law. It is not confined to Worcester or any other particular town or city in the Commonwealth.

It is the State law. It says they shall be aided at the expense of the city or town in which they may have a settlement. And if they have no settlement in any city or town of the State, then they are aided by the State; and they are put on the books of the State Board of Charities, and they are put on the books of the Overseers of the Poor of any city or town, if they comply with the law, as paupers. And when the diphtheria and scarlet fever patients were aided by boards of health, they were put on the books as paupers till that Act was passed some four years ago which prohibited their being pauperized.

DR. CHASE: Mr. President, I was wholly of the opinion of Mr. Newcomb, that a tubercular patient in an advanced stage, who was taken to the hospital, either forcibly or voluntarily, would not be pauperized under the Public Statutes. The matter was carefully looked into by officers of the Board of Health of Brookline, and I think in some other places. I won't go into that now. This matter ought to be settled. We ought to find out who is right in this matter. Personally, I believe Dr. Durgin is wholly right. But to bring the matter before us, a matter in which we are all interested, I move you, Mr. Chairman, that a committee of, say, three, appointed by the Chairman, be appointed to take up the subject matter of the question stated by Dr. Durgin, and report at a later meeting to this Association; and let them take up the matter early enough to get any legislation that may be necessary to put a tubercular patient in an advanced condition, in the same class as to pauperization as a diphtheria or scarlet fever patient.

The motion was seconded and adopted.

MR. COFFEY: I move that the Chairman be added to that committee.

The motion was seconded, was put by Dr. Durgin and was

unanimously carried. The president announced the names of the committee, as follows: Dr. Chase, Mr. Coffey and Dr. Durgin.

DR. CHASE: Mr. Chairman, I desire to withdraw in favor of the president of the Association.

THE PRESIDENT: He is already there, unfortunately.

DR. CHASE: I thought it was to be a committee of three; and, it is so much easier for a small committee to accomplish such things, I would like to have it made three, and retire in favor of the president of the Association.

THE PRESIDENT: No, there will be no trouble. It is a committee of four, and we have got to fight it out.

Is there any other business to come before the Association at this time?

(Adjourned.)

MUNICIPAL SANITATION.

By Charles V. Chapin, M. D.,
Superintendent of Health, Providence, R. I.

SOME ENGLISH NOTES. It is a curious fact that while almost all English public officials hold office during good behavior and are subject to civil service rules, it is otherwise with health officers. With very few exceptions their term of office is for one year. In the large cities, however, public sentiment is so in favor of retaining a good officer that such officials hold office as long as they like. But in small towns and rural districts a single landowner often has enough influence to secure the defeat of a health officer who has caused offense by the discharge of his duty. A bill is now before Parliament to remedy this evil. Salaries are rather higher than with us. The highest in England, $6,000, is paid to the health officer of Brighton. The health officer of Bristol, with a population of over 300,000, receives $4,000.

In England the Local Government Board has much greater control over local sanitation than have the state boards with us. In the large cities, however, the local officers are not often interfered with, though there are a number of absurd restrictions relating to hospital construction, drainage, etc. Thus the local government may and does prescribe such details as the size of hospital closets and the kind of fixtures that shall be put in bath rooms. It appears that this central control tends in the large cities to stifle progress, for the local official who devotes his whole time to his work is more likely to know what is best, than officers at a distance who are not directly occupied in local administration. In rural districts on the other hand the inexperience of the health officers demands the advice and control of the central board.

Contagious disease hospitals are much more common in England than with us. Nearly every city is provided with one and rural districts often combine to establish a common hospital. Then, too, more beds per population are provided, one to each 1000 of the population being recommended and often furnished. The air space per bed, 2000 cubic feet is more than is common in the United States, and for this reason and because of the more substantial and finer construction, the expense is greater, being often $2,000 to $2,500 per bed. The lower cost of land in the United States is more than offset by the higher price of building materials. As might be expected every effort is made by the use of plane surfaces and rounded edges to prevent accumulations of dust, but it is rather curious to see in some hospitals rugs on the floors and carpet-backed easy chairs.

Much less attention is paid to the carrying of infection than with us. The nurses do not wear gowns at their work but go directly from their wards in their ward clothes, to common eating and sitting rooms. Scarlet fever and diphtheria nurses live together. Physicians as a rule do not wear gowns and in only one hospital was I as a visitor, requested to do so, and then it was only for moral effect. In one hospital

which I visited different diseases are treated in the same ward, though in separate rooms, and the nurse passes from one to the other, the only precaution being the washing of the hands if the patient has been touched. I cannot find that cross infection occurs any more often than with us but as statistical data are wanting on both sides of the water it is impossible to be sure of this. Accurate statistics of infection in hospitals would throw much light on the mode of transference of the contagious diseases. Many English health officers do not attach much importance to aerial infection. On the other the local government board believes that small pox infection may be conveyed a mile or more from a hospital, and hence require all such hospitals to be in a very isolated place. In one of the large London hospitals when it is time to discharge a diphtheria patient a bath is given, fresh sheets put on the bed and the patient kept in the ward over night before discharged. Cases of typhoid fever are usually treated in contagious hospitals though, of course, in separate wards.

Patients with scarlet fever and diphtheria are usually kept in the hospital longer than with us. Most of the English health officers that I have met do not attribute any importance to desquamation as a factor in infection. The secretions from nose and ear are believed to be contagious and patients are not sent home while there is any appreciable nasal discharge. The average detention in the hospital is over eight weeks. It is only within a year or two that the London hospitals have made it routine practice to require cultures before the release of diphtheria patients. Since this has been required it has been found that the bacilli usually disappear by the end of the first month but most of the patients are not fit to be discharged for another month. As plenty of antitoxin is used it is not unlikely that a more severe type of diphtheria prevails in London than with us. This possible variation in the type of the disease reminds me that Dr. Davies found a peculiar form of diphtheria bacillus for some time in one of the suburbs of Bristol, just as Hill in Boston,

Gorham in Providence and Amyot in Toronto found different types of the organisms in different localities.

VETERINARY SANITATION.

By Veranus A. Moore, M. D.,
Cornell University, Ithaca, N. Y.

MILK AND DAIRY PRODUCTS AS SOURCES OF INFECTION IN TUBERCULOSIS. Muller* has contributed a valuable article on the vexed questions pertaining to the extent of human infection of tuberculosis from milk and dairy products. He summarizes his findings as follows:

1. "The infectivity of milk and its products, provided the contamination of these by means of the feces and excreta of tuberculous animals has been excluded, is mainly referable to tuberculosis of the udder. Cows not affected with udder tuberculosis do not excrete tubercle bacilli, or at least not to any considerable extent."

2. "The transmission of tuberculosis is effected, in the first place, through the milk of cows with udder tuberculosis. In addition, the milk of clinically tuberculosis animals, and of those in which the disease has reached an advanced stage, although the udder is not involved, are capable of causing infection; and this in no slight degree may be ascribed to a contamination of the milk with feces and excreta. Contrary to what is the case with milk from tuberculous cows whose udders are not affected, the infectivity of which is nearly entirely abolished by dilution (as in ordinary mixed milk), the milk of cows affected with udder tuberculosis retains its pathogenic power after even the strongest dilution, and this warrants the conclusion that cows with udder tuberculosis are solely responsible for infection by means of such dairy products as butter, cheese, and butter-milk.

3. "Infection by milk and dairy products is particularly

* Jour. Comp. Path. and Therapeutics, Vol. xix., p. 19.

frequent in districts with a large dairy industry, especially in calves and pigs. In pigs it often leads in a short time to a progressive tuberculosis, and, since experience indicates that there are practically no other sources of infection for these animals it acquires a great importance. Even in the care of calves and adult cattle the danger of the transmission of tuberculosis through milk and dairy products cannot be declared slight, although here it does not occupy a place of the first importance, as it does in the care of pigs.

4. "There is also a danger of the transmission of tuberculosis through milk and dairy products (butter, butter-milk, etc.) to human beings, but at the present time it is impossible to say what is the extent of this danger.

5. "To avoid the danger it is necessary to eliminate all cows with udder tuberculosis and all otherwise clinically tuberculous cattle, and to observe the greatest care and cleanliness in order to prevent contamination of the milk with the discharges of tuberculous animals. As a further precaution, milk and dairy products, before they are issued from the creameries, ought to be heated to 85° C."

SEWAGE POLLUTION OF DRINKING WATER AS A CAUSE OF DISEASE IN ANIMALS. Much interest is attached to verdict given in an action before the sheriff-substitute in Ayr, Scotland, in which the plaintiff was awarded 200 pounds damages and costs for damages to cattle caused by drinking from a polluted water supply. The specific damage charged was that the contaminated water produced abortion in the cattle as well as causing diminution in the quantity of milk secreted. The decision seems to have been rendered on the statements of two distinguished professors that the cows had been poisoned by the bacteria in the water. There seems to be some difference of opinions on this subject. However, the case is an important one, calling attention to the desirability of pure water for domesticated animals.

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